



Trippy RGB Color-Mixing Nightlight

Written By: paul reisinger



TOOLS:

- [AXE026](#)
[PICAXE](#)
[Serial](#)
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[Cable \(1\)](#)
[or AXE027](#)
[- PICAXE](#)
[USB](#)
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[Cable](#)
- [AXE029](#)
[Breadboard](#)
[Adapter \(1\)](#)
- [Hot glue](#)
[gun \(1\)](#)
- [PICAXE](#)
[Program](#)
[Editor \(1\)](#)



PARTS:

- [5MM Red LED \(1\)](#)
[Mouser 696-SSL-LX5093XRC/4](#) <http://www.mouser.com>
- [5MM Green LED \(1\)](#)
[Mouser 696-SSL-LX5093UEGC](#)
- [5MM Blue LED \(1\)](#)
[Mouser 696-SSL-LX5093USBC](#)
- [Solid-core hook up wire \(20 inches\)](#)
[Mouser, Radio Shack or other](#)
- [20 ohm 1/4 W resistor \(2\)](#)
[Mouser 66-RC07GF200J](#)
- [100 ohm 1/4 W resistor \(1\)](#)
[Mouser 588-OD101JE](#)
- [100K ohm 1/4 W resistor \(3\)](#)
[Mouser 291-100K-RC](#)
- [Perf board \(1\)](#)
[Radio Shack 276-148](#)
- [Stripboard \(1\)](#)

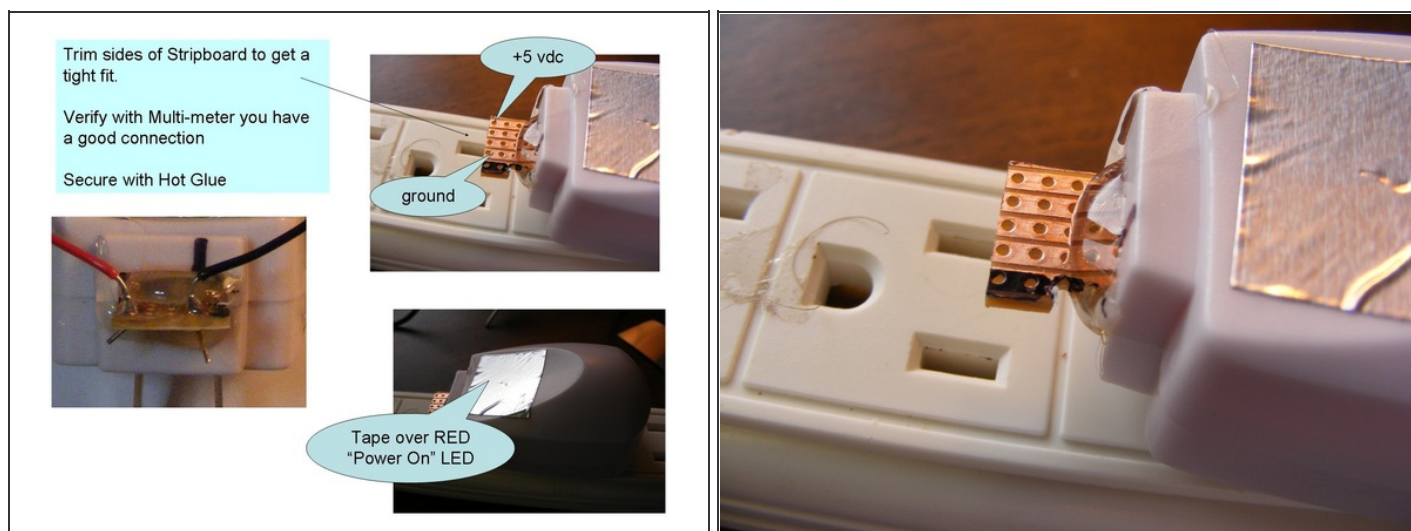
<ul style="list-style-type: none"> • Soldering iron (1) • Solderless breadboard (1) • Mouser. • Radio Shack or other • Tin snips (1) 	<ul style="list-style-type: none"> • Mouser 854-ST3U • PICAXE 08M IC (3) • http://www.phanderson.com/picaxe/ • 8-Pin DIP IC socket (3) • Radio Shack 276-1995 or other • Charger USB/AC for MP3 Players (1) • http://www.amazon.com/gp/product/B000A2BLEC/ref=ox_ya_os_product • Jell-O snack cups (2) • Supermarket • Saran Wrap (1) • Supermarket • Sheet metal strip (1) • Home Depot or hardware store • Double-sided foam tape (1 ft.) • Hardware store or Radio Shack • Scrap piece of cardboard (1) • Supermarket
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SUMMARY

For this variation on the [original Trippy Nightlight](#) an inexpensive (> \$2.50) USB AC charger provides a traditional nightlight plug-in-the-wall form factor. To simplify the main circuit board I removed the download circuitry from the board and instead programmed the PICAXE 08M microcontrollers on a separate breadboard. Instead of a quartz crystal, two Jell-O snack-size containers and a little bit of Saran Wrap diffuse the light.

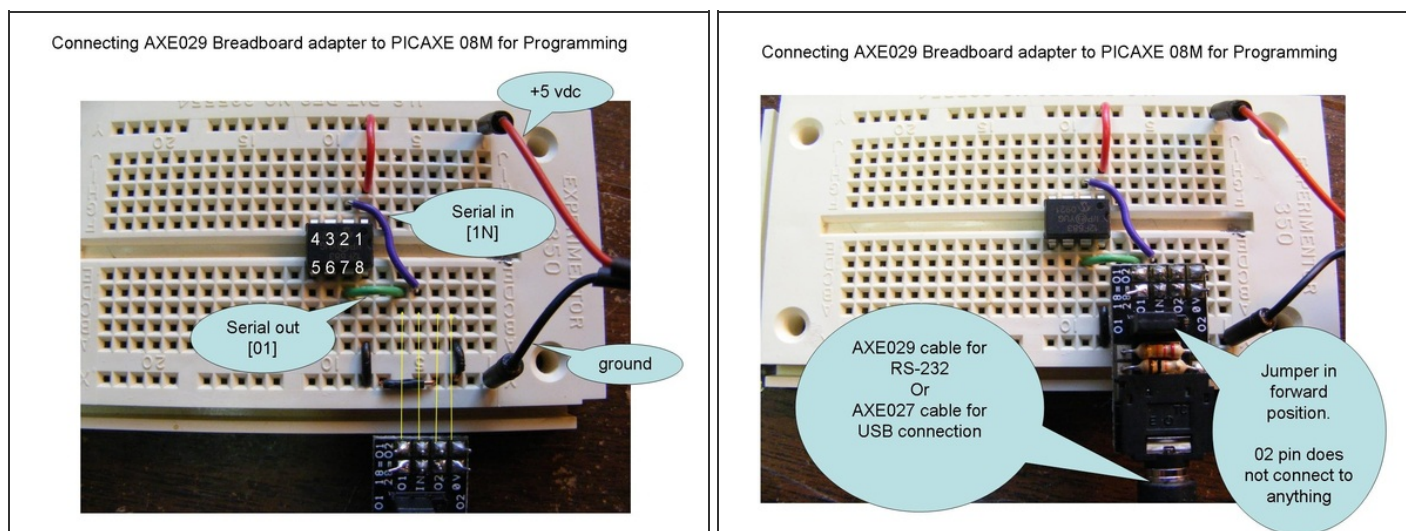
Total materials cost is about \$15.00. The unit has been running problem-free for over six months. Electricity usage is almost too low to measure. Watch the YouTube video below to see the nightlight cycle through its color changes.

Step 1 — Prepare Power Supply



- Cut a piece of stripboard a little more than 4 traces wide and about 3/4 inches long.
- Sand or file down edges so it fits tightly in USB charger socket with the 4 Traces centered within the socket so you're making a good connection with left side +5 VDC pin & right side ground pin. Verify that you're getting a good connection with a multi-meter. Secure stripboard with hot glue.
- If you don't have another 5 VDC power supply to use for programming the PICAXE ICs in the next step then you can now solder Red (+5VDC) and Black (ground) wires to stripboard. Make wires a little long so you can use it to power the PICAXE chip on the breadboard during programming.
- Otherwise you can wait until after you have built the main circuit board to solder the power supply wires.
- Tape over USB Charger's "Power On" red LED to block its light.

Step 2 — Program PICAXE 08M ICs



- Build up solderless breadboard with PICAXE 08M IC and AXE029 breadboard adapter as shown in photographs.
- For additional info go [here](#), and/or see the PICAXE Manual 1 available from the Programming Editor Help menu.
- Download Programming Editor from [PICAXE website](#) and install on your computer. Connect your PC using either Serial or USB cable, and download programs to PICAXE ICs. You can download the code [here](#).
- For additional help with programming, see the Editor's Help menu. Manual 1 is the most helpful for getting started the first time.
- You need to program three PICAXE chips, one for each color LED – red, green, and blue. Program code is the same for each LED except for one line of code as shown below. Red LED: Colorinc =17 Green LED: Colorinc =23 Blue LED: Colorinc =37 This provides an offset so as to get a pleasing mix of color variations.

www.makeprojects.com



Step 4 — Final Assembly



- Bend LEDs together so they will fit inside Jell-O cup. To diffuse the light, wrap LEDs with Saran Wrap - experiment to get pleasing visual effect.
- Rough up outside of the Jell-O cups using sandpaper.
- Put first Jell-O cup over LEDs and Saran wrap, wrap thin layer of Saran Wrap outside the first Jell-O cup, then install second Jell-O cup on top of the first cup. Again, experiment to get the most pleasing visual effect. Finally, attach Jell-O cups to cardboard base using hot glue. That's it; you're done!

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